

## APPENDIX

# Syntax Guide to UNIX Commands

# B

This appendix provides a quick reference to the UNIX commands and utilities covered in this text. Table B-1 lists the commands alphabetically, including the command name, its purpose, and any useful options. Table B-2 lists the UNIX utilities by category. Table B-3 summarizes the vi editor commands, while Table B-4 summarizes the emacs editor commands. The UNIX command syntax uses the format diagrammed in Figure B-1.

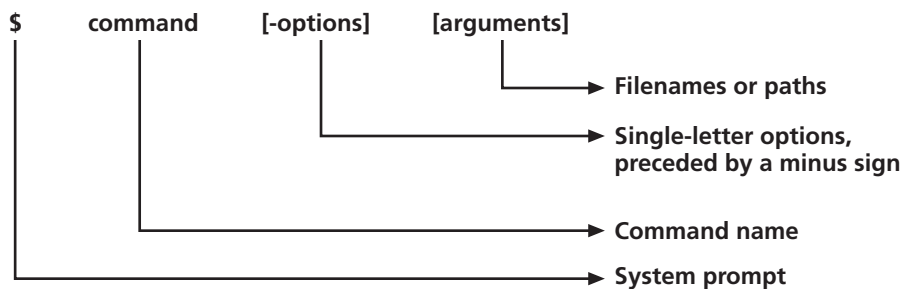


Figure B-1: Command syntax format

| Command      | Purpose   | Useful Options  |
|--------------|---|---|
| <b>alias</b> | Create an alias for a command   |   |
| <b>awk</b>   | Invoke a pattern-scanning and processing language   | -f indicates code is coming from a disk file, not the keyboard.<br>-F specifies the field separator.          |
| <b>cal</b>   | Show the system calendar for a specified year or month  | -j displays the Julian date format.   |
| <b>cat</b>   | Concatenate or display files  | -n displays line numbers.   |
| <b>cd</b>    | Change directories  |   |
| <b>chmod</b> | Change security mode of a file or directory (r: read, w: write, x: executable)<br>Set file permissions for specified users (u: user, g: group, o: others, a: all) |   |
| <b>clear</b> | Clear the screen  |   |
| <b>comm</b>  | Compare sorted files and show differences   |   |
| <b>cp</b>    | Copy files from one directory to another  | -i requests confirmation if the target file already exists.<br>-r copies directories to a new directory.      |
| <b>cut</b>   | Select and extract columns or fields from a file  | -c specifies the character position.<br>-d specifies the field separator.<br>-f specifies the field position. |

| Command               | Purpose   | Useful Options   |
|-----------------------|---|--|
| <b>date</b>           | Display the system date   | <b>-u</b> displays the time in Greenwich Mean Time.  |
| <b>diff</b>           | Compare and select differences in two files   |  |
| <b>. (dot)</b>        | Run a process in the current directory  |  |
| <b>.. (dot dot)</b>   | Run a process in the parent directory   |  |
| <b>echo</b>           | Display the specified arguments on the output device  |  |
| <b>emacs</b>          | Start the emacs editor  |  |
| <b>exit or logout</b> | Exit UNIX   |  |
| <b>export</b>         | Export a specified list of variables to other shells<br>Make a variable an environment variable |  |
| <b>find</b>           | Locate files that match a specified criteria  | <b>-name <i>filename</i></b> finds files with the <i>filename</i> .<br><b>-print</b> prints the pathname for each file found.<br><b>-type <i>file type</i></b> finds files with the specified access type.             |
| <b>grep</b>           | Select lines or rows that match a specified pattern   | <b>-c</b> displays the count of matching lines.<br><b>-i</b> ignores case.<br><b>-l</b> lists only filenames.<br><b>-n</b> displays line numbers.<br><b>-v</b> displays lines that do not match the specified pattern. |
| <b>head</b>           | Display the first few lines of a file.  | <b>-n <i>n</i></b> displays the first <i>n</i> lines of the specified file.  |
| <b>history</b>        | List all commands you enter during a UNIX session   |  |

**Table B-1**  
(continued)

| Command     | Purpose   | Useful Options  |
|-------------|---|---|
| <b>join</b> | Join two files, matching row by row   | <p><b>-a <i>n</i></b> produces a line for each unpairable line in file <i>n</i>, where <i>n</i> = 1 or 2.</p> <p><b>-e <i>str</i></b> replaces the empty fields for the unpairable line with the string specified by <i>str</i>.</p> <p><b>-j</b> specifies the common fields on which the join is to be made.</p> <p><b>-o</b> specifies a list of fields to be output. The list contains blank-separated field specifiers in the form <i>m.n</i>, where <i>m</i> is the file number and <i>n</i> is the position of the field in the file. Thus <b>-o 1.2</b> means output the second field in the first file.</p> <p><b>-t</b> specifies the field separator character. By default this is a blank, tab, or new-line character. Multiple blanks and tabs count as one field separator.</p> |
| <b>kill</b> | End a process   |   |
| <b>less</b> | Display a long file one screen at a time, and scroll up and down            |   |
| <b>let</b>  | Store arithmetic values in a variable                                       |   |
| <b>ln</b>   | Create a link between files, thereby allowing more than one name for a file |   |
| <b>lp</b>   | Print a file  | <p><b>-d</b> prints on a specified printer.</p> <p><b>-n</b> prints a specified number of copies of the file.</p>   |

**Table B-1**  
(continued)

| Command         | Purpose   | Useful Options  |
|-----------------|---|---|
| <b>ls</b>       | List a directory's contents, including its files and subdirectories             | -a lists the hidden files.<br>-l lists files in long format, showing detailed information.<br>-r lists files in reverse alphabetic order.<br>-s shows the size of each file.    |
| <b>man</b>      | Display the online manual for the specified command                             |   |
| <b>mkdir</b>    | Make a new directory  |   |
| <b>more</b>     | Display a long file one screen at a time  |   |
| <b>mount</b>    | Connect the file system partitions to the directory tree when the system starts | -r indicates that the mounted device is read-only.<br>-t specifies the type of file system.   |
| <b>mv</b>       | Move or rename files  |   |
| <b>passwd</b>   | Change your UNIX password   |   |
| <b>paste</b>    | Paste multiple files, column by column  |   |
| <b>pr</b>       | Format a specified file before printing or viewing                              | -a displays output in columns across the page, one line per column.<br>-d double-spaces the output.<br>-h customizes the header line.<br>-ln sets the number of lines per page. |
| <b>printenv</b> | Print a list of environment variables   |   |
| <b>printf</b>   | Tell the Awk program what action to take  |   |
| <b>pwd</b>      | Display your current path   |   |

**Table B-1**  
(continued)

| Command                 | Purpose   | Useful Options   |
|-------------------------|---|--|
| <b>rm</b>               | Remove a file   | -i requests confirmation before deleting a file.<br>-r deletes a specified directory and its contents.   |
| <b>rmdir</b>            | Remove a directory  | -i requests confirmation before deleting a file.<br>-r deletes a specified directory and its contents.   |
| <b>sed</b>              | Specify an editing command or a script file containing sed commands | -a \ appends text after a line.<br>-d deletes specified text.<br>-e specifies multiple commands on one line.<br>-n indicates line numbers.<br>-p displays lines.<br>-s substitutes specified text.   |
| <b>set -o noclobber</b> |   | Prevents files from being overwritten by the > operator  |
| <b>sh</b>               | Execute a shell script  | -n reads commands without executing them.  |
| <b>sort</b>             | Sort and merge multiple files                                       | +.+ designates the position that follows an offset (+) as a character position, not a field position.<br>+n sorts on the field specified by <i>n</i> .<br>-b ignores leading blank characters.<br>-d sorts in dictionary order.<br>-f indicates that a specified character separates the fields.<br>-m merges files before sorting.<br>-n sorts numbers arithmetically.<br>-o directs the sorted output to a specified file. |

**Table B-1**  
(continued)

| Command | Purpose                                    | Useful Options  |
|---------|--|---|
| tail    | Display the last few lines of a file       | -n <i>n</i> displays the last <i>n</i> lines of the specified file.   |
| test    | Compare values and validate file existence | ! logical negation<br>-a logical AND<br>-b tests if a file exists and is a block special file (which is a block-oriented device, such as a disk or tape drive).<br>-c tests if a file exists and is a character special file (that is, a character-oriented device, such as a terminal or printer).<br>-d true if a file exists and is a directory.<br>-e true if a file exists.<br>-eq equals to.<br>-f tests if a file exists and is a regular file.<br>-ge greater than or equal to<br>-gt greater than<br>-le less than or equal to<br>-lt less than<br>-n tests for a non-zero string length.<br>-ne not equal to<br>-o logical OR<br>-r true if a file exists and is readable.<br>-s true if a file exists and its size is greater than zero.<br>string tests for a non-zero string length.<br>string1 = string2 tests two strings for equality.<br>string1 != string2 tests two strings for inequality.<br>-w true if a file exists and is writeable<br>-x true if a file exists and is executable<br>-z tests for a zero-length string. |

Table B-1  
(continued)

| Command       | Purpose   | Useful Options  |
|---------------|---|---|
| <b>top</b>    | Display a list of the most CPU-intensive tasks, such as the processor state, in real time | <ul style="list-style-type: none"> <li><b>-c</b> displays the command line that initiated each process.</li> <li><b>-l</b> ignores any idle processes.</li> <li><b>-q</b> displays output continually, with no delay between outputs.</li> <li><b>-s</b> causes the top command to run in secure mode, disabling its interactive commands.</li> <li><b>-S</b> runs top in cumulative mode, which displays the cumulative CPU time used by a process.</li> </ul> |
| <b>touch</b>  | Change a file's time and date stamp   | <ul style="list-style-type: none"> <li><b>-a</b> updates access time only.</li> <li><b>-c</b> prevents touch from creating a file that it does not exist.</li> <li><b>-m</b> updates the modification time only.</li> </ul>   |
| <b>tput</b>   | Format screen text  | <ul style="list-style-type: none"> <li><b>clear</b> clears the screen.</li> <li><b>cols</b> prints the number of columns on the current terminal.</li> <li><b>cup</b> moves the screen cursor to a specified row and column.</li> <li><b>rmso</b> disables boldface output.</li> <li><b>smso</b> enables boldface output.</li> </ul>  |
| <b>tr</b>     | Translate characters  | <ul style="list-style-type: none"> <li><b>-d</b> deletes input characters found in <i>string1</i> from the output.</li> <li><b>-s</b> checks for sequences of <i>string1</i> repeated consecutive times.</li> </ul>   |
| <b>trap</b>   | Executes a command when a specified signal is received from the operating system          |   |
| <b>umount</b> | Disconnect the file system partitions from the directory tree                             |   |
| <b>uniq</b>   | Select unique lines or rows   | <ul style="list-style-type: none"> <li><b>-d</b> outputs one copy of each line that has a duplicate.</li> <li><b>-u</b> outputs only the lines of the source file that are not duplicated.</li> </ul>   |
| <b>wc</b>     | Count the number of lines, bytes, or words in a file                                      | <ul style="list-style-type: none"> <li><b>-c</b> counts the number of bytes or characters.</li> </ul>   |

**Table B-1**  
(continued)



| Command       | Purpose                                  | Useful Options  |
|---------------|--|---|
| <b>whatis</b> | Display a brief description of a command | -l counts the number of lines.<br>-w counts the number of words.                                      |
| <b>who</b>    | See who is logged on to UNIX             | -H displays column headings.<br>-i displays session idle times.<br>-q displays a quick list of users. |

Table B-1: Common UNIX commands

| Command                        | Purpose   |
|--------------------------------|---|
| <b>File Processing Utility</b> |   |
| <b>afio</b>                    | Create an archive or restore files from archive |
| <b>awk</b>                     | Process files                                   |
| <b>cat</b>                     | Display or join files                           |
| <b>cmp</b>                     | Compare two files                               |
| <b>comm</b>                    | Compare sorted files and show differences       |
| <b>cp</b>                      | Copy files                                      |
| <b>cpio</b>                    | Copy and back up files to an archive            |
| <b>cut</b>                     | Select characters or fields from input lines    |
| <b>dd</b>                      | Copy and convert input records                  |
| <b>diff</b>                    | Compare two text files and show differences     |
| <b>fdformat</b>                | Format a floppy disk at a low level             |
| <b>find</b>                    | Find files within file tree                     |
| <b>fmt</b>                     | Format text very simply                         |
| <b>grep</b>                    | Match patterns in a file                        |
| <b>groff</b>                   | Process embedded text-formatting codes          |
| <b>gzip</b>                    | Compress or decompress files                    |
| <b>head</b>                    | Display the first part of a file                |
| <b>ispell</b>                  | Check one or more files for spelling errors     |
| <b>less</b>                    | Display text files (pause when screen is full)  |
| <b>ln</b>                      | Create a link to a file                         |
| <b>lpr</b>                     | Print file (hard copy)                          |

| Command                      | Purpose  |
|------------------------------|--|
| <b>ls</b>                    | List file and directory names and attributes                                 |
| <b>man</b>                   | Display documentation for commands   |
| <b>mkdir</b>                 | Create a new directory   |
| <b>mkfs</b>                  | Build a UNIX file system   |
| <b>mv</b>                    | Rename and move files and directories  |
| <b>od</b>                    | Dump formatted file  |
| <b>paste</b>                 | Horizontally concatenate files   |
| <b>pr</b>                    | Display and format files   |
| <b>rdev</b>                  | Query or set the root image device   |
| <b>rm</b>                    | Remove files   |
| <b>rmdir</b>                 | Remove directory   |
| <b>sed</b>                   | Edit streams (non-interactive)   |
| <b>sort</b>                  | Sort or merge files  |
| <b>tail</b>                  | Display the last lines of files  |
| <b>tar</b>                   | Copy and back up files to a tape archive                                     |
| <b>touch</b>                 | Change file modification dates   |
| <b>uniq</b>                  | Display unique lines of sorted file  |
| <b>wc</b>                    | Count lines, words, and bytes  |
| <b>System Status Utility</b> |  |
| <b>chgrp</b>                 | Change the group associated with a file                                      |
| <b>chmod</b>                 | Change the access permissions of a file                                      |
| <b>chown</b>                 | Change the owner of a file   |
| <b>date</b>                  | Set and display date and time  |
| <b>df</b>                    | Display the amount of free space remaining on disk                           |
| <b>du</b>                    | Summarize file space usage   |
| <b>file</b>                  | Determine file type (e.g., shell script, executable, ASCII text, and others) |
| <b>finger</b>                | Display detailed information about users who are logged on                   |

**Table B-2**  
(continued)

| Command                      | Purpose  |
|------------------------------|--|
| <b>free</b>                  | Display amount of free and used memory in the system             |
| <b>kill</b>                  | Terminate a running process                                      |
| <b>ps</b>                    | Display process status by process identification number and name |
| <b>sleep</b>                 | Suspend execution for a specified time                           |
| <b>top</b>                   | Dynamically display process status, like ps, but in real time    |
| <b>w</b>                     | Display detailed information about users who are logged on       |
| <b>who</b>                   | Display brief information about users who are logged on          |
| <b>Network Utility</b>       |  |
| <b>ftp</b>                   | Transfer files over a network                                    |
| <b>rcp</b>                   | Remotely copy a file from network computer                       |
| <b>rlogin</b>                | Log on to a remote computer                                      |
| <b>rsh</b>                   | Execute commands on a remote computer                            |
| <b>rwho</b>                  | Display the names of users attached to a network                 |
| <b>telnet</b>                | Connect to remote computer on a network                          |
| <b>Communication Utility</b> |  |
| <b>mail</b>                  | Send electronic mail messages                                    |
| <b>mesg</b>                  | Deny (mesg n) or accept (mesg y) messages                        |
| <b>pine</b>                  | Send and receive electronic mail and news                        |
| <b>talk</b>                  | Let users simultaneously type messages to each other             |
| <b>write</b>                 | Send a message to another user                                   |
| <b>Programming Utility</b>   |  |
| <b>configure</b>             | Automatically configure program source code                      |
| <b>gcc</b>                   | Compile C and C++ programs                                       |
| <b>make</b>                  | Maintain program source code                                     |

**Table B-2**  
(continued)

| Command                      | Purpose  |
|------------------------------|--|
| <b>patch</b>                 | Update source code   |
| <b>Source Code Utility</b>   |  |
| <b>ci</b>                    | Create changes in Revision Control Systems (RCS)                       |
| <b>co</b>                    | Retrieve an unencoded revision of an RCS file                          |
| <b>cvs</b>                   | Manage concurrent access to files in a hierarchy                       |
| <b>rcs</b>                   | Create or change attributes of an RCS file                             |
| <b>rlog</b>                  | Print a summary of the history of an RCS file                          |
| <b>Miscellaneous Utility</b> |  |
| <b>at</b>                    | Execute a shell script at a specified time                             |
| <b>cal</b>                   | Display a calendar for a month or year                                 |
| <b>crontab</b>               | Schedule a command to run at a preset time                             |
| <b>expr</b>                  | Evaluate expressions (used for arithmetic and string manipulations)    |
| <b>fsck</b>                  | Check and fix problems on a file system (repairs damages)              |
| <b>tee</b>                   | Clone output stream to one or more files                               |
| <b>tr</b>                    | Replace specified characters, like a translation filter                |
| <b>tty</b>                   | Display terminal pathname, like the built-in command, <code>pwd</code> |
| <b>xargs</b>                 | Convert standard output of one command into arguments for another      |

Table B-2: UNIX utilities by category

| Command           | Purpose   |
|-------------------|---|
| <b>!</b>          | Leave vi temporarily                            |
| <b>. (repeat)</b> | Repeat your most recent change                  |
| <b>/</b>          | Search forward for a pattern of characters      |
| <b>d\$ or D</b>   | Delete from the cursor to the end of the line   |
| <b>d0</b>         | Delete from the cursor to the start of the line |

| Command    | Purpose  |
|------------|--|
| <b>dd</b>  | Delete the current line  |
| <b>dw</b>  | Delete the word above the cursor. If the cursor is in the middle of the word, delete from the cursor to the end of the line. |
| <b>I</b>   | Switch to insert mode  |
| <b>P</b>   | Paste text from the clipboard  |
| <b>q</b>   | Cancel an editing session  |
| <b>r</b>   | Read text from one file, and add it to another   |
| <b>set</b> | Turn on line numbering   |
| <b>U</b>   | Undo your most recent change   |
| <b>Vi</b>  | Start the vi editor  |
| <b>w</b>   | Save a file and continue working   |
| <b>wq</b>  | Write changes to disk and exit vi  |
| <b>x</b>   | Save changes and exit vi   |
| <b>x</b>   | Delete the character above the cursor  |
| <b>Y</b>   | Copy (yank) text to the clipboard  |
| <b>ZZ</b>  | In command mode, save changes and exit vi  |

Table B-3: Summary of vi commands

| Alt Commands    | Purpose   |
|-----------------|---|
| <b>Alt+&lt;</b> | Move cursor to start of file                                      |
| <b>Alt+&gt;</b> | Move cursor to end of file  |
| <b>Alt+B</b>    | Move cursor back one word   |
| <b>Alt+D</b>    | Delete current word   |
| <b>Alt+F</b>    | Move cursor forward one character                                 |
| <b>Alt+Q</b>    | Reformat current paragraph using word wrap so that lines are full |
| <b>Alt+T</b>    | Transpose word under the cursor with the following word           |
| <b>Alt+U</b>    | Capitalize all letters of the current word                        |
| <b>Alt+W</b>    | Scroll up one screen  |

| Alt Commands             | Purpose  |
|--------------------------|--|
| <b>Alt+X doctor</b>      | Enter doctormode to play a game in which emacs responds to your statements with questions. Save your work first. Not all versions support this mode. |
| <b>Ctrl Commands</b>     |  |
| <b>Ctrl+@</b>            | Put a mark at the cursor location. After moving the cursor, you can move or copy text to the mark.   |
| <b>Ctrl+A</b>            | Move cursor to start of line   |
| <b>Ctrl+B</b>            | Move cursor back one character   |
| <b>Ctrl+D</b>            | Delete the character under cursor  |
| <b>Ctrl+E</b>            | Move cursor to end of line   |
| <b>Ctrl+F</b>            | Move cursor forward one character  |
| <b>Ctrl+G</b>            | Cancel the current command   |
| <b>Ctrl+H</b>            | Use online help  |
| <b>Ctrl+K</b>            | Delete text to the end of the line   |
| <b>Ctrl+N</b>            | Move cursor to next line   |
| <b>Ctrl+P</b>            | Move cursor to preceding line  |
| <b>Ctrl+T</b>            | Transpose the character before the cursor with the one under the cursor  |
| <b>Ctrl+V</b>            | Scroll down one screen   |
| <b>Ctrl+W</b>            | Delete marked text. See Ctrl+@ (kept in buffer). Press Ctrl+Y to restore deleted text.   |
| <b>Ctrl+Y</b>            | Insert text from the buffer, and place it after the cursor   |
| <b>Ctrl Combinations</b> |  |
| <b>Ctrl+H+C</b>          | Display the command that runs when you press a particular key  |
| <b>Ctrl+H+T</b>          | Run an emacs tutorial  |
| <b>Ctrl+X, Ctrl+C</b>    | Exit emacs   |
| <b>Ctrl+X, Ctrl+S</b>    | Save the file  |
| <b>Ctrl+X, U</b>         | Undo the last change   |
| <b>Ctrl+Del</b>          | Delete the character under the cursor  |

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**Table B-4:** Summary of emacs commands